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FIRST RECORD OF THE GENUS *PROCANACE* HENDEL FROM NORTH AMERICA, WITH THE DESCRIPTION OF A NEW SPECIES (DIPTERA: CANACIDAE)

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Abstract.—The genus *Procanace*, previously known only from the Indopacific, Hendel is reported from North America for the first time, and a new species, ***P. dianneae***, is described and illustrated from specimens collected in Virginia. A revised key to the genera occurring in North America is presented, as well as one to the species groups of *Procanace*.

Key Words: Diptera, Canacidae, *Procanace*, species groups, new species

Beach flies of the genus *Procanace* Hendel were previously known from littoral habitats, both marine and freshwater, within the basins of the Pacific and Indian oceans (Afrotropical, Oriental, eastern Palaearctic, and Oceanian regions). No species were known from the Western Hemisphere, and it was an unexpected surprise to discover a new species of *Procanace* on the tidal shores of the Potomac River in peninsular Virginia, thousands of kilometers from its nearest congener and within a drainage system of the Atlantic Ocean.

A further anomaly of this discovery concerns the climate of the area. Although a few species of *Procanace* occur in temperate regions (Japan), greater species diversity occurs in the tropics and subtropics. Thus, the discovery of a new species in temperate Virginia was again unanticipated.

The purpose of this paper is to describe the new species, provide a diagnosis to the genus and an annotated key to its species groups, and to present a revised key to the genera of the family Canacidae that occur in North America. The key to genera will essentially be an updating of Wirth's key (1987) that was recently published in the *Manual of Nearctic Diptera*, Volume 2. In addition to *Procanace*, the generic key also includes *Paracanace* Mathis and Wirth even though that genus has not yet been recorded from the United States. *Paracanace* has been found in Cuba and Mexico, however, and I would expect it to occur along the Gulf Coast in the southeastern United States. The chapter on the family Canacidae in the *Manual* should be consulted for additional details on the family, its biology, and characterization.

It is timely that this species be described now so that its record, including that of the genus, can be incorporated in a checklist of Nearctic Diptera that is being prepared.

Methods.—The descriptive format used in this paper essentially adheres to that which I have published elsewhere in the family Canacidae (Mathis 1988). The terminology used for anatomical structures follows McAlpine (1981) with the exceptions that have been noted previously (Mathis 1986). For the convenience of the user, the definition of M vein ratio of the wing is: the straight line distance along M between crossveins rm and dm-cu/distance apical of crossvein dm-cu.

Key to Genera of Canacidae in North America

1. Lateroclinate fronto-orbital setae 4. Presutural acrostichal setae present; acrostichal setulae numerous, in four irregular rows. Female cercus with 1 large apical seta that is usually acutely pointed (subfamily Canacinae) ..... *Canacea* Cresson
– Lateroclinate fronto-orbital setae 3. Presutural acrostichal setae absent; acrostichal setulae sparse or absent. Female cercus with 2 large setae, 1 apical and 1 subapical, each usually rather broadly rounded (subfamily Nocticanacinae) 2
2. Interfrontal setae absent, although anterior ⅓ of frons occasionally with scattered setulae ..... *Procanace* Hendel
– Interfrontal setae present, 1 or more pairs in additional to any setulae 3
3. Two interfrontal setae present; postocellar setae well developed, proclinate and slightly divergent ..... *Paracanace* Mathis and Wirth
– One interfrontal seta present; postocellar setae either much reduced or absent 4
4. Disc of scutellum with setae; 3 large anaclinate genal setae ..... *Canaceoides* Cresson
– Disc of scutellum lacking setae; 2 anaclinate genal setae ..... *Nocticanace* Malloch

Genus *Procanace* Hendel

Procanace Hendel 1913: 93. Type species: *Procanace grisescens* Hendel, by original designation.

Diagnosis.—General coloration whitish gray, olivaceous, to blackish brown.

Head: Interfrontal setae absent, but with a few setulae inserted anteriorly; fronto-orbital setae 3; ocelli arranged to form equilateral or isosceles triangle, if isosceles, the greater distance is between posterior ocelli. Arista pubescent over entire length. Two large anaclinate genal setae; anteroclinate genal seta moderately well developed. Palpus not bearing long setae. Epistomal margin, in lateral view, more or less horizontal.

Thorax: Acrostichal setae, especially a prescutellar pair of large setae, usually lacking (setulae present in species of the *williamsi* group); scutellar disc lacking setae (1–2 pairs of scutellar disc setulae occur in *P. nakazatoi* Miyagi of the *williamsi* group); 2 pairs of marginal scutellar setae, apical pair not anaclinate; anterior and posterior notopleural setae present, length of both subequal; anepisternum with scattered setulae. Katepisternal setal usually present (lacking in species of the *grisescens* group). Hind tibia lacking spine-like setae apically.

Abdomen: Male genitalia as follows: Epandrium in posterior view wider than high; cerci reduced, poorly sclerotized; surstylus with an anterior and posterior lobe, the latter larger, sometimes markedly so and shape unique to species.

Discussion.—*Procanace* is probably a monophyletic taxon, although the evidence is weak, i.e. the lack of interfrontal setae and the more or less horizontal epistomal margin. The possibility remains that the genus is paraphyletic, which is a common condition for groups that include disjunct species.

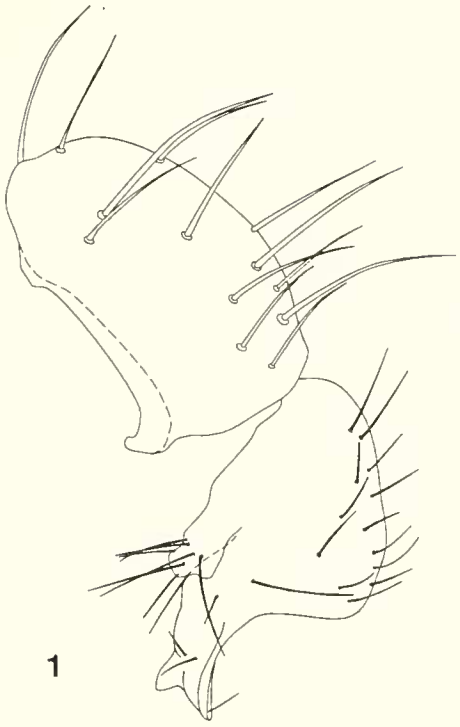
Annotated Key to Species Groups of *Procanace* Hendel

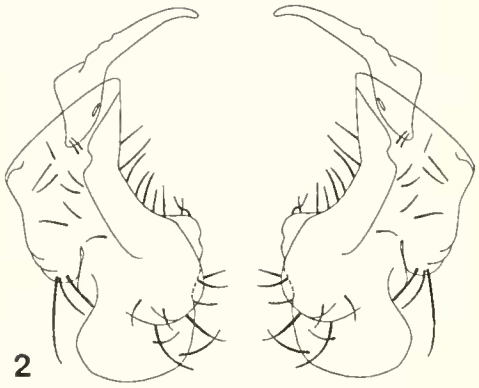
1. Katepisternal seta absent ..... the *grisescens* group 4 species; Oriental, eastern Palaearctic, Oceanian, Malagasy, Seychelles
– Katepisternal seta present 2
2. Clypeus high, width about twice the height; palpus blackish brown; proepisternal seta absent ..... the *nigroviridis* group 7 species; Hawaiian Islands
– Clypeus low, width at least 4 times the height; palpus yellowish; proepisternal seta(e) present 3
3. Acrostichal setulae present, in 2 irregular rows ..... the *williamsi* group 4 species; Hawaiian and Ryukyu Islands
– Acrostichal setulae absent 4
4. Postocellar setae either absent or much reduced ..... the *fulva* group 9 species; Oriental and eastern Palaearctic
– Postocellar setae present, subequal to length of ocellar seta ..... the *cressoni* group 3 species; Oriental, Nearctic

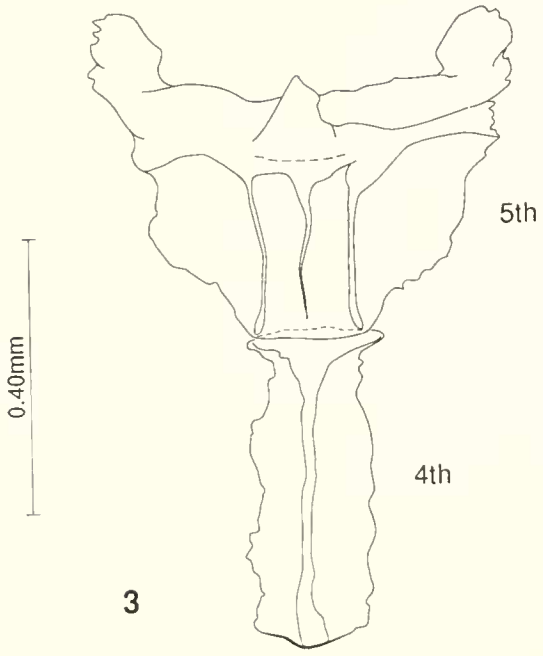
Procanace dianneae Mathis, New Species

Fig. 1–3

Diagnosis.—Extenally this species is very similar to those of the *cressoni* group, and







Figs. 1–3. *Procanace dianneae*. 1, Epandrium and surstylus, lateral view. 2, Surstyli, posterior view. 3, Sterna 4–5 of male, ventral view.

I am tentatively placing it in that group. It differs from the two species of that group, *P. cressoni* Wirth and *P. taiwanensis* Delfinado, as well as other congeners by the following combination of characters: Postocellar setae well developed, subequal in length to ocellar setae; clypeus low, height ¼ width; palpus yellowish. Scutum mostly bluish black, sparsely microtomentose, scutum densely microtomentose, brown; proepisternal seta present, pale; katepisternal seta present; acrostichal setae absent. Shape of the male genitalia unique (see figs. and description below).

Description.—Moderately small to medium-sized beach flies, length 2.0 to 3.1 mm; general coloration whitish gray, olivaceous to brown, scutum darker.

Head: Frons with ocellar triangle and fronto-orbits mostly grayish but usually with some golden coloration, especially on anterior half of fronto-orbits, mesofrons mostly golden brown but with some rust to reddish coloration toward base of ocellar triangle; anterior half of mesofrons bearing about 10 setulae; postocellar setae well developed, length subequal to that of ocellar setae; middle fronto-orbital seta inserted slightly closer to posterior fronto-orbital seta than to anterior seta. First and 2nd antennal segments and arista dark colored, grayish black; 1st flatellomere reddish brown to brown; palpus yellow; face mostly white but with faint bluish to olivaceous coloration; gena mostly concolorous with face, posterior portion slightly more olivaceous. Gena bearing 1 anteroclinate and 2 anaclinate, well-developed setae and 2 setulae between them. Clypeus low, height about ¼ width.

Thorax: Scutum mostly subshining, bluish black, sparsely microtomentose but microtomentum becoming denser laterally, whitish or olivaceous gray to brown; scutellum densely microtomentose, brown; pleural areas densely microtomentose, mostly gray but with some olivaceous and light brown coloration. Acrostichal setulae absent; 3rd dorsocentral seta inserted at level of or anterior to supra-alar seta; anterior notopleural seta present, well developed, size subequal to posterior seta; proepisternal setae present but pale colored; anepisternum with few scattered setulae, mostly in more or less vertical arrangement in middle and along posterior margin; katepisternal seta present, well developed, katepisternum with several setulae anterior to large seta. Femora, tibiae, and most tarsomeres of male yellowish with light dusting of whitish gray microtomentum on dorsal surface, females with microtomentum on legs more extensive and darker; tarsomeres becoming darker apically, apical 1–2 tarsomeres blackish; fore femur bearing 5–6 moderately long and evenly spaced setae along posteroventral margin, basal 1–2 pale; mid femur bearing row of setae, these more evident and closely set on apical ⅓. Wing with length of apical section of vein CuA_1 moderately long, subequal to length of crossvein dm-cu; M vein ratio 0.6.

Abdomen: Unicolorous, olivaceous gray with some faint brownish coloration. Male abdomen as follows: 4th sternum (Fig. 3) narrowly rectangular, over 2× as long as wide; 5th sternum (Fig. 3) wider than long, width of anterior margin subequal to that of 4th sternum, becoming wider posteriorly, lateral margins irregular, widest at posterior margin, bearing a short process posterolaterally; epandrium wider than high in posterior view, bearing numerous setae, in lateral view (Fig. 1) posterodorsal margin broadly rounded, ventral margin nearly flat, anterior margin nearly straight except for anteroventral prong and irregular dorsal ⅓; surstylus (Figs. 1, 2) as 2 processes, anterior one much smaller, digitiform, bearing several setulae preapically and apically, posterior process much larger, length nearly equal to that of epandrium and equally as wide, in lateral view with posterior margin irregularly arched, anteroventral process very angulate in lateral view and spatulate in posterior view.

Type material.—The holotype male is labeled "USA. VIRGINIA[:] Westmoreland

Co. & Park (bank Potomac River)[,] 9 Oct 1987[,] W. N. & D. Mathis." Allotype female and 87 paratypes (65 ♂, 22 ♀; USNM) bear the same label data as the holotype. The holotype is double mounted (minute nadel in a plastic elastomer block), is in excellent condition, and is deposited in the National Museum of Natural History, Smithsonian Institution.

Etymology.—It is a pleasure to name this species after my wife, Dianne, in recognition of her many contributions to my studies of Diptera. Dianne was also a collector of the type series.

Natural history.—All specimens of the type series were collected from the shoreline of the tidal portion of the Potomac River at Westmoreland State Park. At the park, the river is over a mile wide, due largely to the tidal influence, and the water is slightly brackish. The shore is either almost entirely sand, the bathing area of the beach, or a combination of sand, considerable gravel, and some cobble and large rocks. In the latter habitat, the shore is quite narrow, at most two to three meters, and immediately adjacent to the shore is a cliff. In the sandy area, specimens occurred along the protected sides of narrow, wooden jetties that were installed perpendicular to the shoreline to break up the action of waves and prevent erosion of the beach. In the sand/cobble/rock habitat, specimens were found only on the rocks and were easily collected by sweeping immediately over and between the rocks. Most of the rocks and jetties were covered in part with algae, and I suspect that the larvae of this species were feeding on them.

Remarks.—The Chesapeake Bay is one of the busiest commercial waterways in the world, and I do not dismiss the possibility that this species, albeit previously unknown, was introduced in conjunction with the large volume of traffic on these waters.

Acknowledgments

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